Danfoss AK-RC 305W Temperature Controller for Walk In Coolers and Freezers Installation Guide

ENGINEERING
TOMORROW
Installation Guide
Temperature controller for walk-in coolers and freezers, Type AK-RC 305W

Warnings

- If the equipment is used without adhering to the manufacturer's instructions, the device safety requirements could be compromised. Only probes supplied by Danfoss must be used for the unit to operate correctly.
- From -40 – +20 °C, if the NTC probe is extended to 1000 m with at least 0.5 mm² cables, the maximum deviation will be 0.25 °C

- It should be installed in a place protected from vibrations, water, and corrosive gases, where the ambient temperature does not exceed the value indicated in the technical data.
- For the reading to be correct, the probe should be used in a place without heat influences apart from the temperature you want to measure or control.
- The IP65 protection degree is only valid with the protection cover closed.
- The IP65 protection degree is only valid if the cables enter the device using a tube for electric conductions + gland with IP65 or above.
  The size of the glands should be suitable for the diameter of the tube used.
- Do not spray the unit directly with high-pressure hoses, as this could cause damage.

Contents

IMPORTANT:

- Before starting the installation, you must take the advice of local regulations in force.
- The AUXILIARY relays are programmable, and their operation depends on the configuration.
- The function of the digital inputs depends on the configuration.
- The recommended currents and powers are the maximum working currents and powers.

Wiring

Always disconnect the power supply to do the wiring.
The probes and their cables should NEVER be installed in a conduit together with power, control, or power supply cables.
For disconnection, the power supply circuit must be equipped with at least a 2 A, 230 V switch, located near the device. The power
supply cable shall be of the H05VV-F or NYM 1×16/3 type. The cross-section to be used will depend on the local regulations in force, but must never be less than 1.5 mm^2.
Cables for relay or contactor outputs must have a cross-section of 2.5 mm^2 and allow working temperatures equal to or over 70 °C and must be installed with as little bending as possible.
The 120/230 V~ wiring area must be kept clear of any other external element.
The wiring to be undertaken depends on the option selected in the initial configuration wizard. Use the appropriate diagram based on the option selected. Check the available options on the diagrams included in the controller's packaging. Wizard refers to a built-in tool to guide the user through the setup process.

Maintenance

- Clean the surface of the unit with a soft cloth, water, and soap.
- Do not use abrasive detergents, petrol, alcohol, or solvents, as this might damage the unit.

Keypad

 ESC	Pressing it for 3 seconds activates/deactivates Stand-By mode. In this mode, regulation is paused and the icon is displayed. In the programming menu, this exits the parameter without saving changes, returns to the previous level, or exits programming.
	Pressing once without holding displays the temperature of probe S2 for 2 seconds (if it is enabled). Pressing it for 3 seconds starts/stops the defrost. In the programming menu, this allows scrolling around the different levels, or, during the setting of a parameter, changing its value.
	A brief press shows the ADAPTIVE mode operating alerts. Pressing it for 3 seconds activates/deactivates continuous cycle mode. In the programming menu, this allows scrolling around the different levels, or, during the setting of a parameter, changing its value.
 SET	Pressing once without holding activates/deactivates the cold room light. Pressing it for 3 seconds accesses the condensed programming menu. Pressing it for 6 seconds accesses the expanded programming menu. In the programming menu, this accesses the level shown on the display or, during the setting of a parameter, accepts the new value.
 SP	Pressing once without holding displays the current effective value of the Set Point, taking into consideration temporary modifications by other parameters (C10 or C12). When an alarm is in progress, pressing once without holding mutes the acoustic alarm. Pressing for 3 seconds accesses the Set Point setting.

Indicators

	**Fixed:** Stand-by Mode activated. Regulation is paused. **Flashing:** Controlled shutdown process for the regulation in progress.
	**Fixed:** Cold room door open. **Flashing:** The door has been open for a greater time than has been defined in parameter A12.
	There is an active alarm, but not an active HACCP alarm.
	**Fixed:** HACCP alarm active. **Flashing:** HACCP alarm registered and unconfirmed. Press the  key to confirm a HACCP alarm.
	**Fixed:** The ADAPTIVE mode is active. **Flashing:** An error has been detected in the ADAPTIVE mode.
	**Fixed:** Evaporator fans are active. **Flashing:** The evaporator fans should be active but a delay is preventing this.
	**Fixed:** The cold solenoid is active. **Flashing:** The solenoid should be active but a delay or protection is preventing this.
	**Fixed:** Compressor active. **Flashing:** The compressor should be active but a delay or protection is preventing this.
	Defrost relay active.
	The continuous cycle mode is active.
	Cold room light active.
	The alarm in progress is muted.
°F °C	Temperature displayed in ° Fahrenheit / ° Centigrade.
PRG	Programming mode active.

STAND-BY

 If the temperature regulation cannot be instantly stopped due to its configuration, a controlled stop process starts, and the  icon flashes. To stop the controlled stop process and force the step to Stand-by, press the Stand-by key again for 3 seconds.

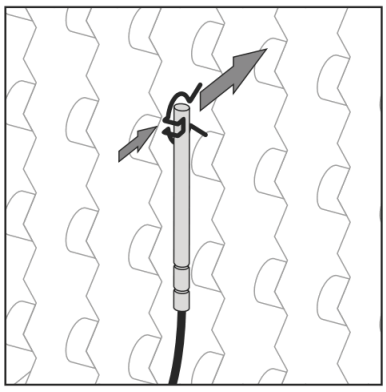
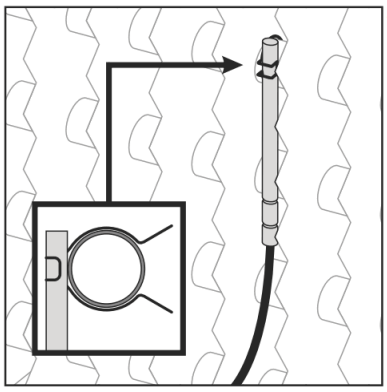
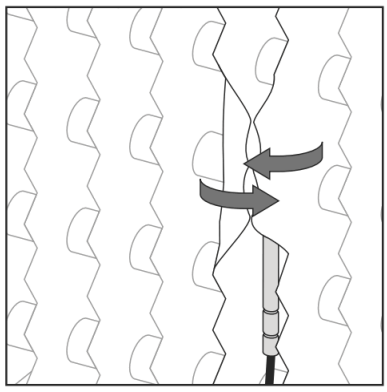
Installation of the probes

To achieve maximum performance from the advanced controller, the correct installation of the probes is key, as they are responsible for calculating the evaporator's thermal transfer coefficient, evaluating the start and end of the defrosts, and diagnosing problems in the evaporator.

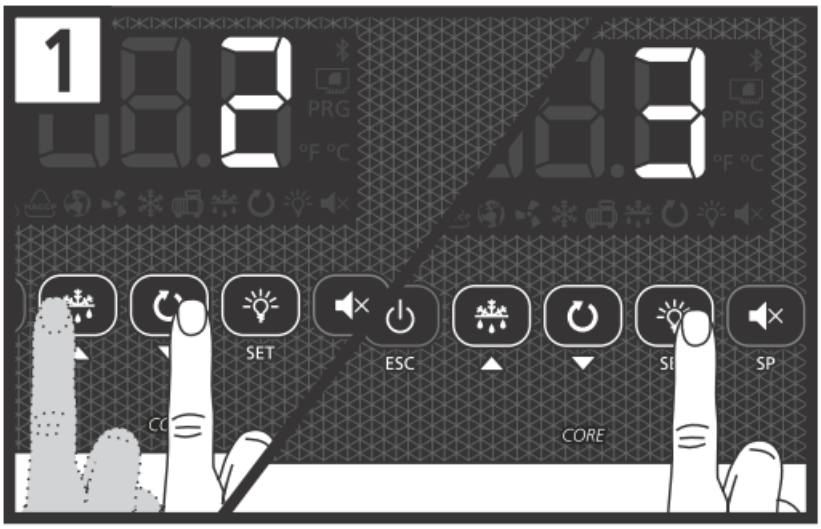
Material included

- 4 mm hermetic evaporator probe, 1.5 m of cable.
- Ambient probe
- 1 mounting clip for 10 – 13 mm coil
- 1 mounting clip for 14 – 18 mm coil
- 1 mounting clip for 19 – 21 mm coil
- 1 mounting clip for 22 – 25 mm coil

Location of the ambient probe
The probe should be located in a place that does not directly receive the flow of cold air from the evaporator. Preferably in its air aspiration area.
Location of the evaporator probe
The probe must be located as near as possible to the inlet of refrigerant from the evaporator (close to the expansion valve) in the finned area. In certain evaporators, for example, cubic ones, this inlet may be located on the front part of the battery, just behind the fan.
If defrost is done by electric heat, the probe must be located far away from them and, if possible, in the area of the evaporator where defrosting is slower, in other words, in the last area to defrost.
If the two conditions are not possible, the best possible compromise must be looked for.

Select the appropriate clip dependi ng on the size of its evaporator pip e.	Attach the probe to the pipe using t he clip, making sure that its end is i n direct contact with the tube.	Bend the fins of both ends of the pr obe to increase the fixing and conta ct surface.
		

Initial configuration (wizard)
The first time the unit receives the power supply, it will enter into ASSISTANT mode. The display will show the message flashing with 0.
Step 1:
Select the most suitable InI option based on the type of installation to be carried out and press SET. The available options will be shown in the following table:



Inl	Type of installation				Parameters										Diagram to be used
	Cold regulation	Pump Down	Defrost	Evap. fans	Pd	o00	I00	I10	I11	I20	I21	dI	d7	F3	
0	Demo Mode: it displays the temperature but does not			regulate the temperature or activate relays											
1	Solenoid	No	Electric	Yes	0	0	2	0	0	0	0	20	0	0	A
2	Solenoid + compressor	Yes	Electric	Yes	1	1	2	7	1	0	0	20	0	0	B
3	Solenoid + compressor	No	Electric	Yes	0	1	2	0	0	0	0	20	0	0	B
4	Solenoid	No	Air	Yes	0	0	1	0	0	0	0	20	1	1	A
5	Solenoid + compressor	Yes	Air	Yes	1	1	1	7	1	0	0	20	1	1	B
6	Solenoid + compressor	No	Air	Yes	0	1	1	0	0	0	0	20	1	1	B
7	Solenoid + compressor	Yes	Hot gas	Yes	1	1	2	7	1	9	1	5	2	0	C
8	Solenoid + compressor	No	Hot gas	Yes	0	1	2	0	0	9	1	5	2	0	C

Note: If options 2, 5, or 7 are chosen, check the configuration of parameter I11 according to the pressure switch type used. (See diagram included with the device).

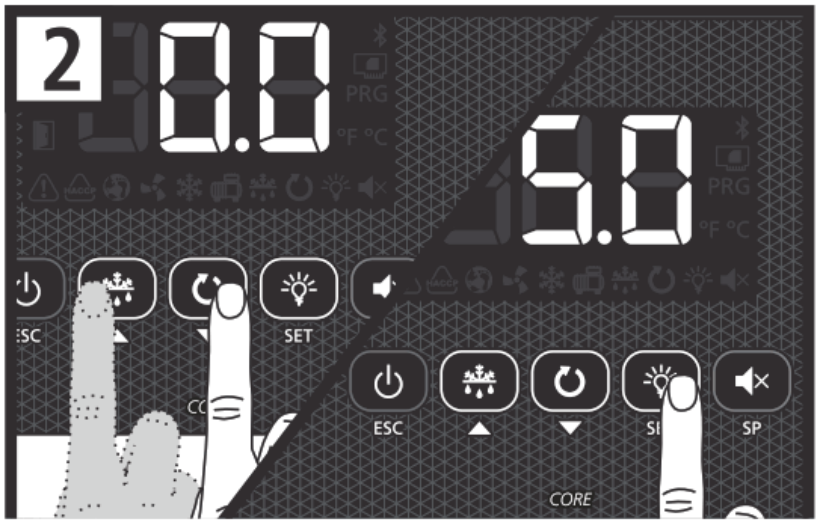
Step 2:

Use keys ▲ and ▼ to enter the desired Temperature Set Point value and press SET. The configuration wizard has finished. The unit will begin to regulate the temperature.

If this is not the first time you use the wizard, after completing the last step the display will show the message dFp (default parameters). You may choose between two options:

0: Only changing the parameters which affect the wizard. The other parameters will remain the same.

1: All parameters return to their factory setting except those which have been modified by the **wizard.**



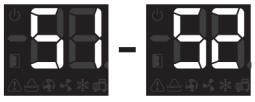
Important: The wizard will not reactivate. To enter the wizard mode, initiate Stand-by mode by pressing the ⏻ key for 3 seconds and wait until the unit completely halts the temperature regulation (the ⏻ indicator will light up permanently) and press the following keys in sequence one after the other, ▲, ▼, SET.

⚠ **Stand-by:** If the regulation cannot be instantly stopped due to its configuration, a controlled stop process starts, and the icon flashes.
To stop the controlled stop process and force the step to Stand-by, press the Stand-by key again for 3 seconds.

Operation

Display messages

	Pump down malfunction error (stop), the time configured in parameter C20 has been ex ceeded. Only displayed on the screen.
	Pump down malfunction error (start-up), the time configured in parameter C19 has been exceeded. Only displayed on the screen.
	Probe 1/2/3 failure (open circuit, crossed circuit or temperature outside the limits of the p robe) (Equivalent limits in °F). Only E2 and E3: Damp evaporator probe. Activates the alarm relay and the audible alarm. Flashing with temperature: Probe error 1/2/3 in ADAPTIVE mode. Flashing with CAL: Probe error 1/2/3 during the calibration.
	Open door alarm. Only if the door remains open for a longer time than defined in parame ter A12. Activates the alarm relay and the audible alarm.
	Maximum temperature in control probe alarm. The temperature value programmed in A 1 has been reached. Activates the alarm relay and the audible alarm.

	The minimum temperature in the control probe alarm. The temperature value programmed in A2 has been reached. Activates the alarm relay and the audible alarm.
	External alarm activated (by digital input). Activates the alarm relay and the audible alarm.
	Severe external alarm activated (by digital input). Activates the alarm relay and the audible alarm.
	Alarm for defrosting completed due to time-out. The time set in d1 has been exceeded. Activates the alarm relay and the audible alarm.
	HACCP alarm. The temperature has reached the value of parameter h1 during a longer period than established in h2. Activates the alarm relay and the audible alarm.
	HACCP alarm due to a power supply failure. The temperature established in h1 has been reached, following a power supply failure. Activates the alarm relay and the audible alarm.
	Indicates that a defrost is being performed. Only displayed on the screen.
	Password request. See parameters b10 and PAS. Only displayed on the screen.
	Shown sequentially with the temperature: The controller is in demo mode, and the configuration has not been made.
	Calibration is ongoing, therefore, avoid, as far as possible, opening the cold room during the process.
	Flashing with temperature: Configuration has been changed from 1 to 2 evaporators or vice versa.

ADAPTIVE MODE ALERT MESSAGES (Only shown pressing the ▼ key)

	Defrost end error in 1/2 evaporator during the calibration, defrost has not ended due to te mperature.
	Error during calibration in 1/2 evaporator. There is not enough difference in temperature between the cold room probe and the evaporator probe.
	It has not been possible to carry out the calibration due to a lack of stability in the system (Excessive door opening, excessive oscillations in the lower pressure, etc.).
	Error during normal operation (ADAPTIVE Mode active) in 1/2 evaporator. There is not en ough difference in temperature between the cold room probe and the evaporator probe.
	A lack of stability has been detected in the system (Excessive door opening, excessive o scillations in the low pressure, etc.) during normal operation (ADAPTIVE Mode active).
	The persistent lack of stability has led to the deactivation of the ADAPTIVE mode.
	Excessive door openings have been detected during calibration and it has not been possi ble to calibrate.
	Excessive door openings have been detected and the device cannot regulate in ADAPTI VE mode.

ADAPTIVE mode

If the ADAPTIVE mode is activated (default configuration), the device periodically evaluates the evaporator's heat transfer, managing the available resources to maximize it.
The defrosts are minimized, adapting to the changing conditions of the cold room, reducing heat input into the refrigerated space, thermal stress in the evaporator, and energy consumption.
The operation of the evaporate fans is optimized by taking into account the compressor status, evaporate temperature, frost level, the opening of the door, etc.
The control function of the drainage resistor minimizes its activation (moments before starting a defrost), thereby reducing energy consumption.
To achieve the correct operation of the ADAPTIVE mode, it is very important for the probes to be correctly installed, as described on page 3.

Calibration

During the first hours of operation, the device performs two calibrations automatically, during which the display shows the CAL message.
Calibration may take several hours and include several refrigerations and defrost cycles.

During the calibration processes, the following should be avoided:

- Opening the cold room door
- Turning the controller off or putting it on stand-by
- Changing controller parameters, including the set point

IMPORTANT:
While the calibration process is active:

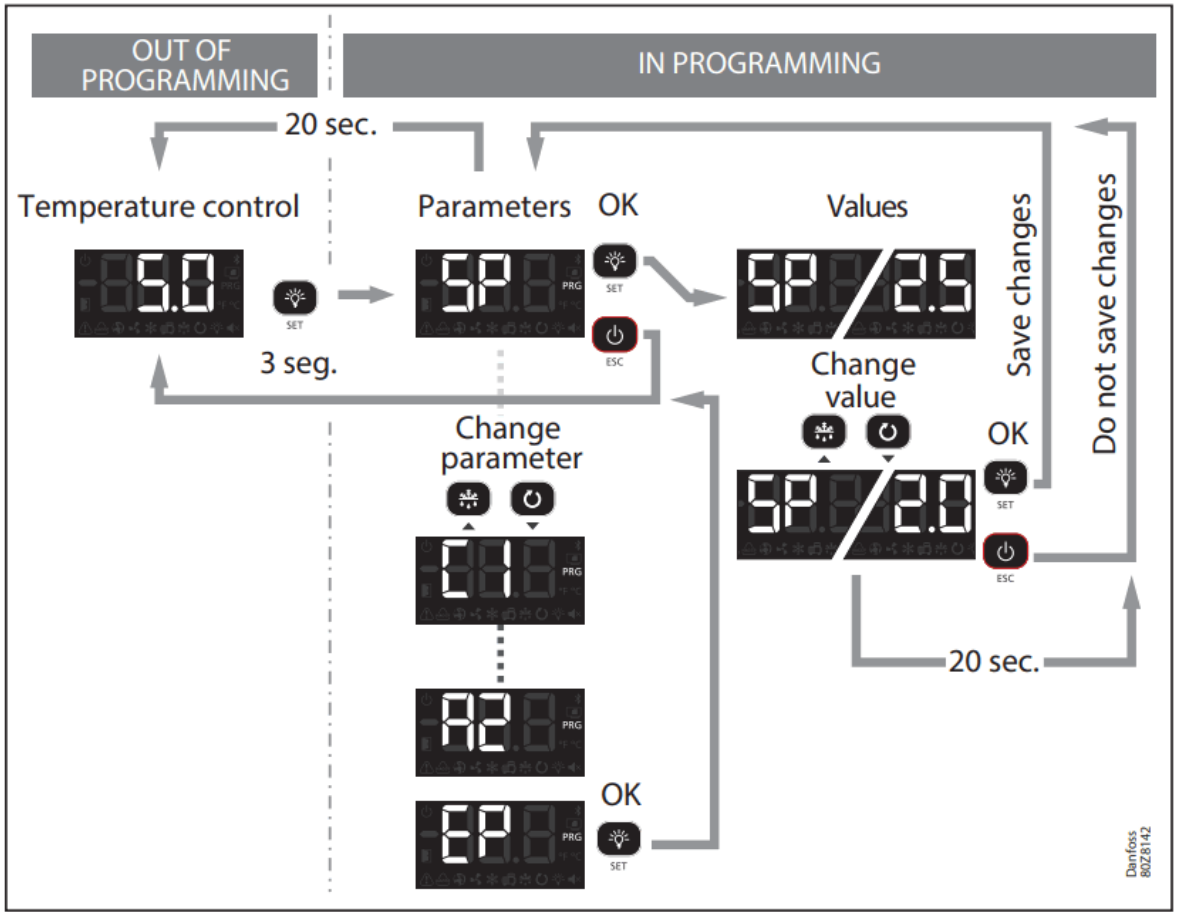
- Manual defrost cannot be activated (key)
- The continuous cycle cannot be activated
- The set point change function cannot be activated

If calibration cannot be performed, or if an important part of the installation is replaced (compressor, evaporator, etc.) it is advisable to perform a manual calibration.
It is also recommended (not essential) to perform a manual calibration, once the installation has completed its commissioning, with a load inside it and when its operating temperature has been stabilized, after several days of operation, in this way calibration is optimal.
In the event of changing the set point or hysteresis, the device performs a calibration again automatically, except if the set point change is made using the “set point change mode” function.

To perform a manual calibration, access the parameter menu and follow the sequence indicated below:

- Access parameter b30
- A security code is requested, enter code 63
- Using keys, select option 1 ▲ and ▼ press SET

Configuration
Condensed programming menu
This allows for the most-used parameters to be quickly configured.
Press the SET key for 3 seconds to access it.



Parameters

Lv 2	Description	Val.	Min.	Def.	Max.
SP	Temperature setting (Set Point)	°C/°F	-50	0.0	99
CE	ADAPTIVE Mode 0=Deactivated, 1= Activ ated		0	1	1
CI	Probe 1 differential (Hysteresis)	°C/°F	0.1	2.0	20.0
dO	Defrost frequency (Time between 2 starts)	H.	0	6	96
dI	Maximum defrost duration (0=defrost deac tivated)	Min.	0		255
d4	Final defrost temperature (by the probe) (If P4 #1)	°C/°F	50	8.0	50
F3	Status of the fans during the defrost: 0=Sh ut down, 1=Running		0	0	1
At	Alarm for the maximum in probe 1 (It shoul d be higher than the SP)	°C/°F	A2	99	99
A2	Alarm for minimum in probe 1 (It should be lower than the SP)	°C/°F	50	50	At
d30	Defrost strategy in ADAPTIVE mode		0	5	10

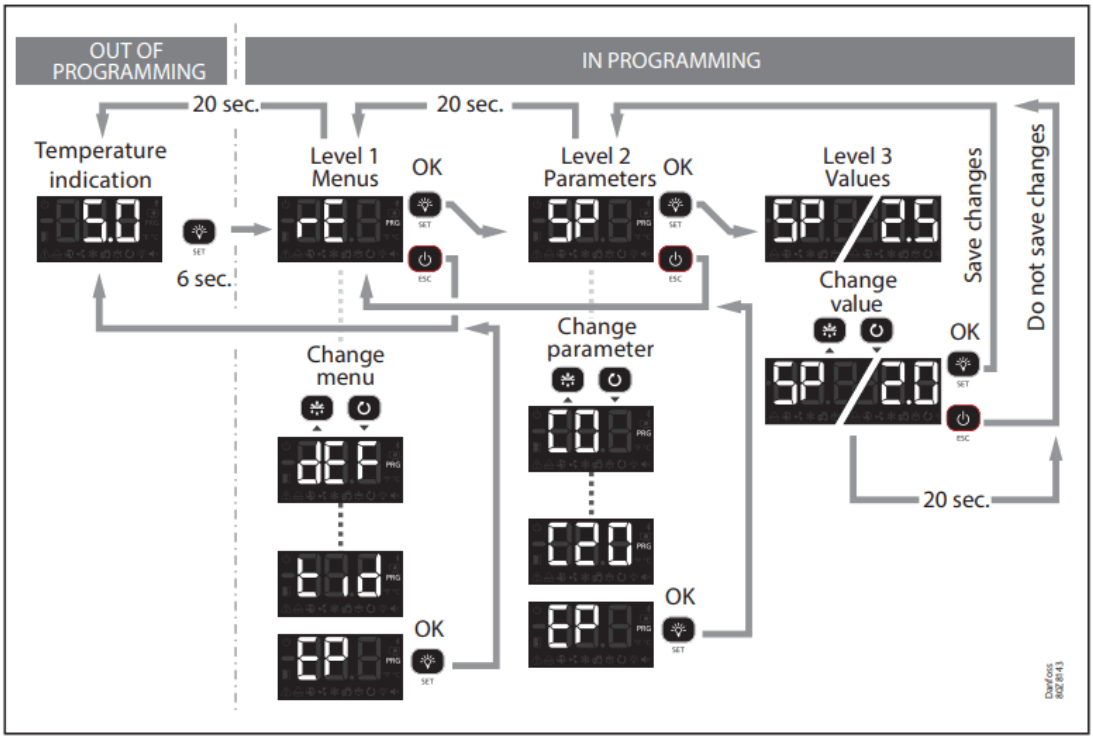
Extended programming menu

Use the extended programming menu to configure all of the unit's parameters in order to adapt it to your

installation requirements.
Press the SET key for 6 seconds to access it.

Important:

- If the password function has been configured as a keypad lock (b10=2), or as access to parameters block (b10=1), you will be requested to enter the password programmed in PAS when attempting to access either of the two functions. If the entered password is not correct, the unit will go back to showing the temperature.
- Certain parameters or menus may not be visible depending on the configuration of the rest of the parameters.



Regulation and control

Level 1	Level 2	Description	Values	Min.	Def.	Max.
	SP	Temperature setting (Set Point)	°C/°F	-50	0	99
	CE	ADAPTIVE Mode: 0=Deactivated, 1= Activated		0	1	1
	C0	Probe 1 & 2 calibration (Offset)	°C/°F	-4	0	4
	C1	Probe 1 differential (Hysteresis)	°C/°F	0.1	2	20
	C2	Set Point top locking (it cannot be set above this value)	°C/°F	C3	99	99
	C3	Set Point bottom locking (it cannot be set below this value)	°C/°F	-50	-50	C2
	C4	Type of delay for the protection of the compressor: 0=Minimum time of compressor in OFF 1=Minimum time of compressor in OFF and in ON in each cycle		0	0	1
	C5	Protection delay time (value of the option selected in parameter C4)	Min.	0	0	120

rE	C6	COOL relay status with a fault in probe 1: 0=OFF; 1=ON; 2=Average according to last 24 h prior to probe error 3=ON-OFF according to prog. C7 and C8		0	2	3
	C7	Relay time in ON in the event of probe 1 failure (If C7=0 and C8≠0, the relay will always be disconnected in OFF)	Min.	0	10	120
	C8	Relay time in OFF in the event of probe 1 failure (If C8=0 and C7≠0, the relay will always be connected in ON)	Min.	0	5	120
	C9	Maximum duration of the continuous cycle mode (0=deactivated)	H.	0	0	48
	C10	Variation of the Set Point (SP) in continuous cycle mode. When it reaches this point (SP+C10), it reverts to the normal mode. (SP+C10 ≥ C3). The value of this parameter is always negative unless it is 0. (0=OFF)	°C/°F	0	-50	C3-SP
	C12	Variation of the Set Point (SP) when the change Set Point function is active. (SP+C12 ≤ C2) (0= deactivated)	°C/°F	C3-SP	0	C2-SP
	C19	Maximum start time from Pump Down (Values between 1 and 9 seconds will not be accepted) (0= deactivated)	Sec.	0	0	120
	C20	The maximum time for pump down (0= deactivated)	Min.	0	0	15
	C21	Probe to be displayed: 0=All probes (sequential), 1=Probe 1 (Cold Room), 2=Probe 2 (Evaporator), 3=Probe 3 (According to I20), 4=Weighted the temperature of the cold room		0	1	3
	C22	Stop fans and compressor on opening door 0=No, 1=Yes		0	0	1
	C23	Start-up delay for fans and compressor with the door open	Min.	0	0	999
	C24	Delay time of cold stop with the door open.	Seg.	0	0	C23
	C25	Influence of probe S3 when regulating with two temperature probes (I20=10)	%	0	0	95
	C27	Probe 3 calibration (Offset)	°C/°F	-4	0	4
	EP	Exit to level 1				

Defrost

Level 1	Level 2	Description	Values	Min.	Def.	Max.
dEF	dO	Defrost frequency (Time between 2 starts)	H.	0	6	96
	dl	Maximum defrost duration (0=defrost deactivated)	Min.	0	.	255
	d2	Type of message during the defrost: 0=Displays the real temperature; 1=Displays the te mperature at the start of the defrost; 2=Displays the dEF message		0	2	2
	d3	The maximum duration of the message (Time adde d at the end of the defrost process)	Min.	0	5	255
	d4	Final defrost temperature (by probe) (1f100 . 1)	°CPF	-50	8.0	50
	d 5	Defrost on connecting the unit: 0=NO First defrost according to d0; 1=YES, First defrost according to d6		0	0	1
	d6	Delay of the defrost start on connecting the unit	Min.	0	0	255
	d7,	Type of defrosting: 0=Resistors; 1=Air/fans, 2=Hot gas; 3=Reversal of cycle		0		3
	d 8	Count of time between defrost periods: 0=Total real-time, 1 =Sum of compressor connecte d time		0	0	1
	d9	Drip time when completing defrost (Shutdown of co mpressor and fans)	Min.	0	1	255
	d30	Defrost strategy in ADAPTIVE mode			5	10
	d31	Maximum time without defrosting (0=Deactivated)	H.	0	96	999
	d32	Maximum time of cold room outside the temperatur e regulation range (0=Deactivated)	H.	0	2	
	EP	Exit to level 1				

* According to the wizard.
1) It can only be modified using the configuration wizard (InI).

Evaporator fans

Level 1	Level 2	Description	Values	Min.	Def.	Max.
FAn	FO	Shutdown temperature of fans	°CPF	-50	45	50
	F1	Probe 2 differential if fans are shut down	°CPF	0.1	2.0	20
	F2	Shut down fans when the compressor shuts down: 0=No, 1=Yes		0		
	F3	Status of the fans during the defrost: 0=Shut down, 1=Running		0	0	1
	F4	l’t ewt oc’nf lsytaartct-uuaPt:fitfeirt iisehfrigc)shterift h119	Min.	0	2	99
	EP	Exit to level 1				

Alarms

Level 1	Level 2	Description	Values	Min.	Def.	Max.
AL	AO	Configuration of the temperature alarms: 0=Fielativ e to SP, Absolute				
	Al	Alarm for maximum A probe 1 (It should be higher t han the SP)	°CrF	A2	99	99
	A2	Alarm for minimum A probe 1 (It should be lower th an the SP)	°CrF	-50	-50	Al
	A3	Delay of temperature alarms in the start-up	M..	0	0	120
	A4	Delay of temperature alarms from the end of a defr ost	MA.	0	0	99
	AS	Delay of temperature alarms from when the Al or A 2 value is reached		0	30	99
	A ,,,,	Delay of the external alarm/Severe external alarm o n receiving a signal A digital input (110 or 120 = 2 o r 3)	Min.	0	0	120
	A, ,,,	Delay of external alarm deactivation/Severe extern al alarm deactivation when the signal in digital input disappears (110 or 120 = 2 or 3)	Min.	0	0	120
	A8	Show warning if the defrost ends for maximum time : 0=No, 1=Yes		0	0	1
	A9	Relay alarm polarity 0= Relay ON in alarm (OFF without alarm); 1= Rela y OFF in alarm (ON without alarm)		0	0	1
	Al 0	The differential temperature alarms (A1 and A2)	°C/°F	0.1	1.0	20.0
	Al2	Delay of open door alarm (If 110 or 120=1)	Min.	0	10	120
	EP	Exit to level 1				

Basic configuration

Level 1	Level 2	Description	Values	Min.	Def.	Max.
BCN	b00	Delay of all functions on receiving power supply	Min.	0	0	255
	b01	Cold room light timing	Min.	0	0	999
		RIncatic°t°f1psword Inive, lock access to parameters, 2=Block keypad		0	0	2
	PAS	Access code (Password)		0	0	99
	b20	MODBUS address		1	1	247
	b21	Communication speed: 0=9600 bps, 1 =19200 bps, 2=38400 bps, 3=57600 bps bps		0	0	3
	b22	Acoustic alarm enabled: 0= No, 1=Yes		0	1	1
	b30	Activation of manual calibration: 0=Deactivated, 1= Activated Requires security code, see page 6.		0	0	1
	Unt	Work units: 0.°C, 1=1		0	1	1
	EP	Exit to level 1				

Inputs and outputs

Level 1	Level 2	Description	Values	Min.	Def	Max.
In0	I00	Connected probes 1=Probe 1 (Cold room), 2=Probe 1 (Cold room) + Probe 2 (Evaporator)		1	2	2
	I10 1)	Configuration of digital input 1 0= Deactivated, 1=Door contact, 2=External alarm, 3=Severe external alarm, 4=Change of SP, 5=Remote defr ost, 6=Defrost block, 7= Low-pressure switch, 8=Remote Stand-by		0	*	8
	I11	The polarity of the digital input 1 0=Activates on closing contact; 1=Activates on opening co ntact		0	*	1
	I20	Configuration of digital input 2 0= Deactivated, 1=Door contact, 2=External alarm, 3=Severe external alarm, 4=Change of SP, 5=Remote defr ost, 6=Defrost block, 7=Register probe, 8=Probe 2° evaporator 2), 9=High pressure switch for Hot Gas, 10=2nd cold room te mperature probe, 11=Product temperature, 12=Remote Stand-by		0	0	12
	I21	The polarity of the digital input 2 0=Activates on closing contact; 1=Activates on opening co ntact		0	0	1
	o00 1)	Configuration of relay AUX1 0=Deactivated, 1=Compressor/Resistor sump, 2=Light, 3= Virtual control		0	*	3
	o10	Configuration of relay AUX2 0=Deactivated, 1=Alarm, 2=Light, 3=Virtual control, 4=Door frame resistance, 5=Defrost 2° evaporator, 6=Same as solenoid status, 7=Same as unit status, 8=Drai nage resistor		0	2	8
	EP	Exit to level 1				

* According to the wizard.
1) It can only be modified using the configuration wizard (InI).
2) Option not available in AK-RC 305W

HACCP alarm

Level 1	Level 2	Description	Values	Min.	Def.	Max.
HCP	h1	Maximum temperature of HACCP alarm	°C/°F	-50	99	99
	h2	Maximum permitted time for activation of the HACCP alarm (0=Disabled)	H.	0	0	255
	EP	Exit to level 1				

Information (reading only)

Level 1	Level 2	Description	Values	Min.	Def.	Max.
tid	InI	Option chosen in the configuration wizard				
	Pd1)	Pump down active? 0=No, 1=Yes				
	PU	Program version				
	Pr	Program revision				
	bU	Bootloader version				
	br	Bootloader revision				
	PAr	Parameter map revision				
	EP	Exit to level 1				

1) It can only be modified using the configuration wizard (InI).

Troubleshooting

Errors during calibration

The error message is displayed alternately with the CAL message. The  icon flashes.

Error	Description	Solution
El/E2/E3	Probe error 1 / 2 / 3	Check condition and wiring of the affected probe.
E10	Evaporator defrost error	Check defrost operation, it must end by temperature (d4).
E20	Idem for El 0 but relating to the second evaporator	
E11	The similar temperature in probes S1 and S2	Check the position of both probes following recommendations on page 3.
E20	Idem for El 1 but relating to probe S3	
El2	It has not been possible to carry out the calibration due to a lack of stability in the system	Avoid opening the cold room doors during calibration. Check the main components of the refrigeration circuit, in particular the aspiration part.
E22	Idem for E12 but relating to the second evaporator	
E17	Excessive door openings have been detected during calibration and it has not been possible to calibrate.	Avoid opening the cold room doors during calibration.

Errors during operation

The error message is displayed alternately with the temperature. The  icon flashes.

Error	Description	Solution
E1/E2/E3	Probe error 1 / 2 / 3	Check the condition and wiring of the affected probe.
E13	The similar temperature in probes S1 and S2	Check the position of both probes following recommendations on page 3.
E23	Idem for E11 but relating to probe S3	
E14	A lack of stability has been detected in the system	Check the main components of the refrigeration circuit, in particular the aspiration part.
E24	Idem for E14 but relating to the second evaporator	
E15	Persistent lack of system stability has led to the deactivation of the ADAPTIVE mode	Check the main components of the refrigeration circuit, in particular, the aspiration part and the position of probe 2 or 3. To return to the ADAPTIVE mode restart the device.
E25	Idem for E15 but relating to the second evaporator	
E16	The configuration has been changed from 1 to 2 evaporators or vice versa.	If the configuration change is correct, start a manual calibration.
E18	Excessive door openings have been detected and the device cannot regulate in ADAPTIVE mode.	Check that the door has not been left open or that it does not open more than necessary.

Technical specifications

Features		Specifications
Power supply		100 — 240 V— 50/60 Hz
Maximum input power in the operation		6.3 VA
Maximum nominal current		15 A
Relay SSV /DEFROST – SPDT – 20 A	NO	EN60730-1: 15 (15) A 250 V—
	NC	EN60730-1: 15 (13)A 250 V—
Relay FAN – SPST -16 A		EN60730-1: 12 (9) A 250 V—
Relay COOL – SPST -16 A		EN60730-1: 12 (9) A 250 V—
Relay AUX 1 – SPDT – 20 A	NO	EN60730-1: 15 (15) A 250 V–
	NC	EN60730-1: 15 (13)A 250 V—
_ _ Relay AUX 2 SPDT 16 A	NO	EN60730-1: 12 (9) A 250 V-
	NC	EN60730-1: 10 (8) A 250 V—
No. of relay operations		EN60730-1:100.000 operations
Probe temperature range		-50.0 —+99.9 °C
The resolution, setting, and differential		0.1 °C
Thermometric precision		±1 °C
Loading tolerance of the NTC probe at 25 °C		±0.4 °C
Working ambient temperature		-10 — +50 °C
Storage ambient temperature		-30 —+60 °C
Protection degree		IP 65
Installation category		II s/ EN 60730-1
Pollution degree		II s/ EN 60730-1
Control device classification		Built-in assembly, with Type 1. B automatic operation action feature, f or use in clean situations, logical support (Software) class A and cont inuous operation. Degree of contamination 2 acc. to UNE-EN 60730-1. Double isolation between the power supply, secondary circuit, and rel ay output.
The temperature during a ball-pressure test		Accessible parts: 75 °C Parts which position active elements: 125 °C
The current radio jamming suppression tests		270 mA
Voltage and current as per EMC tests		207V, 17 mA
Type of Assembly		Fixed internal
MODBUS address		Shown on label
Dimensions		290 mm (W) x 141 mm (H) x 84.4 mm (D)

Internal buzzer	Yes

Ordering
Controller

Model	Description	Comments	Code no.
AK-RC 305W	AK-RC 305W Gen. 2,5 O/P, Single phase	Include: 2 x 1.5 m, NTC 10K sensor	080Z5003

Accessory (for spares and replacement purposes):

Name	Features	Qty
NTC sensors	10K, High Prec. 1.5 m	1

For more details, see the full User Manual and other information, and scan the QR code.

http://scn.by/krzp87a5z2akq1

080R9294

AN41504517847601-000101

Documents / Resources

	**Danfoss AK-RC 305W Temperature Controller for Walk In Coolers and Freezers** [pdf] Installation Guide AK-RC 305W, Temperature Controller for Walk In Coolers and Freezers, AK-RC 305W Temperature Controller for Walk In Coolers and Freezers
	**Danfoss AK-RC 305W Temperature Controller for Walk-In Coolers and Freezers** [pdf] User Guide AK-RC 305W, Temperature Controller for Walk-In Coolers and Freezers, AK-RC 305W Temperature Controller for Walk-In Coolers and Freezers